

Applicant: Martin Kreyenschmidt
Serial No.: 09/763,280
Group Art Unit: 1711

REMARKS

Claims 1, 2, and 11 remain in this application with claim 1 in independent form. Claim 1 has been amended and claim 3 has been cancelled. There is full support in the specification as originally filed for these amendments. Accordingly, no new matter has been introduced by way of these amendments.

Claims 1-3 and 11 stand rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Porter (United States Patent No. 3,373,122). The Examiner contends that Porter discloses polyurethane foams made from polyisocyanates, polyols, blowing agents, tin and amine catalysts, and an anhydride in the same amounts as claimed.

Applicant has amended claim 1 to recite the organic or inorganic acid anhydride is based on one of pyromellitic acid, citraconic acid, itaconic acid, phthalic, isophthalic and/or terephthalic acid, benzoic acid, phenylacetic acid, cyclohexylalkanoic acid, malonic acid, adducts of maleic acid with styrene and/or of maleic acid and alkynes, succinic acid, maleic acid, polymaleic acid, glutaric acid and/or copolymers of the above-mentioned unsaturated acids with comonomers which are copolymerizable with these acids. The reaction of compounds reactive toward isocyanates and the isocyanate/acid anhydride mixture is carried out in the presence of at least one urethane forming catalyst selected from the group consisting of organic amines, excluding alkanolamines, and organic metal compounds.

Claim 1, as amended, further requires that the acid anhydride be based on the specific acid anhydrides and be present in a mixture with the isocyanate. As discussed at length in the

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specification, the presence of the acid anhydride in the mixture with the isocyanate stabilizes the foamed product. This stabilization results because, after forming the polyurethane foam, the acid anhydride remains in the unreacted, or non-hydrolyzed state and can undergo hydrolysis when in the presence of moisture. Once hydrolyzed in the polyurethane foam, the acid deactivates any tertiary amine catalysts, thereby inhibiting the catalysts ability to cleave urethane and urea bonds. (*see page 4, lines 21-46, page 23, lines 16-42*). The stability of the foam and the prevention of the cleaving of the bonds allow the foamed product to be exposed to hot or humid conditions without deteriorating. Examples of the hot or humid conditions include hot steam disinfection for sterilization of mattresses or hot steam cleaning of upholstered furniture or carpets (*see page 5, lines 21-25*).

One advantage of the subject invention is achieved by adding the acid anhydrides in a mixture with the isocyanates instead of into a mixture with compounds that are reactive with the isocyanates. The acid anhydride does not participate in the reaction to form the foam and, therefore, remains in an unreacted state. The unreacted, or non-hydrolyzed, acid anhydride is then available in the prepared foam to prevent the foam from deteriorating as discussed above. Further, the acid anhydrides, if added to the compounds that are reactive with the isocyanates, such as a polyol, react and undergo hydrolysis. This results because the amine catalysts and the water present in such compounds contribute to the hydrolysis of the anhydride and reduces the activity of the catalysis even before the reaction is carried out (*see page 14, lines 1-13*).

Porter discloses a process for preparing an improved polyurethane resin having a mixture of the acid anhydride and the polyol (*see column 1, lines 59-64*). In other words, the

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acid anhydride is mixed with the compounds, such as the polyol, that are reactive toward the isocyanates and that encourage hydrolysis of the acid anhydride (*see column 3, lines 70-75, Column 4, lines 1-9*). Even if the acid anhydride is added quickly or shortly before foaming, the acid anhydride will still rapidly hydrolyze in the presence of the polyol or similar compounds. Porter does not disclose, teach, suggest, or make obvious, a mattress material and/or upholstery material and/or carpet material comprising a flexible polyurethane foam having a density of 20 to 70 kg/m³, wherein the foam is the reaction product of a mixture of isocyanate and acid anhydride with compounds reactive toward the isocyanate. Therefore, the 35 U.S.C. §102(b) and 35 U.S.C. §103(a) rejection is overcome.

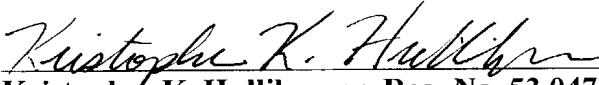
By this Amendment, Applicant believes that the application is placed in a condition for allowance, or alternatively, in a better form for appeal. It is respectfully requested that the Rule 116 Amendment be admitted. To that end, it is respectfully submitted that the Application, as amended, is now presented in condition for allowance, which allowance is respectfully solicited.

Respectfully submitted

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April 2, 2004

Date


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CERTIFICATE OF MAILING

I hereby certify that the attached **Amendment** is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to the Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on April 2, 2004.


Melissa Dadisman

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